

REMARKS

According to the non-final Office Action of 14 December 2007, claims 1-31 are pending and stand rejected. The independent claims are claims 1, 18, 19, and 31.

Several claim amendments are now made, and several new claims are presented. No new matter is introduced; all of the amendments and new claims are fully supported by the specification as originally filed.

Claims 8 and 24 Are Fully Enabled by the Specification

Claims 8 and 24 are rejected under 35 USC § 112, first paragraph, as not being enabled by the specification. Applicants respectfully disagree. Enablement of claims 8 and 24 is supported at least by the paragraph beginning at page 15, line 25 of the substitute specification filed on 19 July; and by the paragraph beginning at page 21, line 1 thereof; and by the paragraph beginning at page 25, line 25 thereof.

Applicants note that present claims 8 and 24 include the phrase “receiver receiving signal in said second frequency band.” As described in the specification, this phrase simply defines the receiver in question, namely the receiver for the second frequency band (e.g. the GPS receiver), not the receiver for the first frequency band (e.g. the cellular receiver). Applicant also notes that the present amendments of claims 8 and 24 should clearly overcome any uncertainty about enablement.

Obviousness Rejections

The independent claims (i.e. claims 1, 18, 19, and 31) are all rejected as obvious from *Krasner* (U.S. Patent No. 6,107,960) in view of *King* (U.S. Patent Application No. 2004/0239559). *Krasner* was filed on 20 January 1998, and *King* was filed on 2 June 2003. The present application has a priority date of 10 June 2003.

Applicants respectfully submit that *King* is not valid prior art in this case, because Applicant conceived the present invention before 2 June 2003, and diligently pursued patent protection from conception until filing the PCT application in this case on 10 June 2003.

Applicants Swear Behind the *King* Reference

The *King* reference was filed on 2 June 2003, i.e., only eight days before the international filing date of the present application on 10 June 2003.

The applicants submit herewith a Rule 131 declaration which constitutes a showing of facts that, in character and weight, establish a conception of the invention prior to the effective date of 2 June 2003 of the *King et al* reference coupled with due diligence from at least immediately prior to said date of June 2, 2003 to the subsequent filing of the application in the International Bureau under International Application No. PCT/IB03/02174 on 10 June 2003.

The showing of facts establishing prior invention constitute a showing of facts in a WTO member country, i.e., Finland after 1 January 1996 (one year after entry into force of the WTO agreement) pursuant to Public Law 103-465. Under the GATT Treaty, patents shall be available without discrimination as to place of invention under 35 U.S.C. § 104.

Under MPEP § 715.07, the essential thing to be shown under 37 CFR 1.131 is priority of invention and this may be done by any satisfactory evidence of the facts.

The attached declaration under 37 CFR 1.131 constitutes a recitation of facts that occurred prior to 2 June 2003 and that establish a fully formed conception of the invention. Attachment 1 to the declaration constitutes an Invention Report dated prior to 2 June 2003 showing the basic idea of the invention.

These facts establish the necessary proof of conception with sufficient clarity to enable one skilled in the art to reduce it to practice without the exercise of extensive experimentation or the exercise of inventive skill. In other words, the Invention Report (Attachment 1 to the declaration) demonstrates the complete performance of the mental part of the inventive act because it shows the formation of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice. Thus, it has been shown by these factual proofs that every feature of the invention was in existence and known at the time of the conception.

Regarding the constructive reduction to practice on 10 June 2003, the subject U.S. patent application Serial No. 10/560,550 is the U.S. national stage of PCT/IB03/02184, and 35 U.S.C. § 104 makes it clear that facts showing a completion of the invention by a 35 U.S.C. § 365 filing is permitted.

Applicant submits that the requirements of 35 U.S.C. § 112, first paragraph, have been met and therefore the international application and this U.S. national stage thereof meets the requirements of 35

U.S.C. § 120 and 112, first paragraph. The technical description in the specification clearly establish a practical utility and sufficient disclosure under the “how to use” and “how to make” requirements thereof. See the declaration for the particular ways in which the claimed invention corresponds to the drawings of the present application. The written description is sufficient so that when the entire specification is considered, the only necessary and reasonable construction that would be given by a person skilled in the art is that each positive limitation of the claims is shown in and supported by the specification and drawings by an enabling disclosure.

Regarding the diligence requirement, the critical period begins not at the time of conception but rather just prior to 2 June 2003, i.e., the date of the 102(e) filing of *King et al.* See MPEP 2138.06 and 715.07(a). The German law firm of Cohausz & Florack was engaged in the drafting process, followed by a filing date on 10 June 2003 coordinated with the filing of three other GPS applications, three of which were handled by Cohausz & Florack and one of which was handled by another firm. It is noted that there was a public holiday in Germany on Monday, June 9, 2003 and thus there was a long holiday weekend of June 7-9, 2003.

Applicant notes that the diligence requirement does not require that “an inventor or his attorney ... drop all other work and concentrate on the particular invention involved.” *Emery v. Ronden*, 188 USPQ 264, 268 (Bd. Patent Iter. 1974). In this instance, there were only four work days between 2 June 2003 and 10 June 2003. Six days to execute and file an application is acceptable. *Haskell v. Coleburne*, 671 F.2d 1362 (CCPA 1982). As indicated by the enclosed Declaration, the application was in draft form in May of 2003, and so filing the application in the early part of June shows reasonable diligence.

CONCLUSION

The *King et al* reference has been removed as an effective 102(e)/103(a) reference, and therefore withdrawal of all obviousness rejection is requested. The Applicants do not concede that any of the cited references render the present claimed invention obvious, and that issue is rendered moot in view of the removal of *King* as a reference.

Applicant submits herewith a petition for an extension of time along with the fee therefor. The Commissioner is authorized, in case the fee is missing or incorrect, to deduct the correct fee from our Deposit Account No. 23-0442. If the fee is excessive or not required, the Commissioner is authorized to credit our Deposit Account No. 23-0442 as well.

The objections and rejections of the Office Action of 14 December 2007, having been obviated by amendment or shown to be inapplicable, withdrawal thereof is requested and passage of the claims to issue is earnestly solicited.

Respectfully submitted,

Dated: March 11, 2008

WARE, FRESSOLA, VAN DER
SLUYS & ADOLPHSON LLP
Building Five, Bradford Green
755 Main Street, P.O. Box 224
Monroe, CT 06468
Telephone: (203) 261-1234
Facsimile: (203) 261-5676
USPTO Customer No. 004955

Andrew T. Hyman
Andrew T. Hyman
Attorney for Applicants
Registration No. 45,858



DECLARATION OF MARKO LEINONEN

I, MARKO LEINONEN, residing at Niilonrinne 14, FI-90830 Haukipudas, Finland, do declare and say:

1. I am an employee of Nokia Corporation, and am a resident citizen of Finland, and am an inventor named in the U.S. Patent Application 10/560,550 which is the U.S. National Stage of PCT Application IB03/02184 filed 10 June 2003.
2. I submitted an Invention Report dated 21 March 2003 (i.e. prior to 2 June 2003) to the Intellectual Property Rights Department of my employer, a copy of which is attached as Attachment 1.
3. That Invention Report represents a definite and permanent idea of the complete and operable invention described in the subject patent application.
4. It illustrates an example of that which is covered by the independent claims of the present invention.
5. I received a draft patent application in May of 2003 and commented thereupon.
6. I sent my comments back to the IPR Department for forwarding to the patent firm of Cohausz & Florack who prepared the international application.
7. The text and drawings of the international application PCT/IB03/02174 filed 10 June 2003 are sufficient to enable any person of skill in the art how to make and use the invention claimed therein and correspond to the fully formed conception thereof evidenced Invention Report at Attachment 1.
8. All of the above described events involving the sending and receiving of emails by me occurred in Finland which is a WTO country and was a WTO country at the time of these events.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that all these statements were made

with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: 11-MAR-2008



Marko Leinonen



DECLARATION OF SEppo ROusu

I, SEppo ROusu, residing at Sahankuja 1, FI-90800 Oulu, Finland, do declare and say:

1. I am an employee of Nokia Corporation, and am a resident citizen of Finland, and am an inventor named in the U.S. Patent Application 10/560,550 which is the U.S. National Stage of PCT Application IB03/02184 filed 10 June 2003.
2. I submitted an Invention Report dated on a date prior to 2 June 2003 to the Intellectual Property Rights Department of my employer, a copy of which is attached as Attachment 1.
3. That Invention Report represents a definite and permanent idea of the complete and operable invention described in the subject patent application.
4. It illustrates an example of that which is covered by the independent claims of the present invention.
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with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: 11 - MAR - 2008

Seppo Rousu
Seppo Rousu

ASIAN PUNTIKSI JORMA MATTILLO
JUHKO MUURKO

NOKIA

CONFIDENTIAL

INVENTION REPORT

Title of the invention: GPS reception attenuation with existence of other transmission		INVENTION REPORT RECEIVED	
		Code: 36616	Patent Engineer/Committee:
Please type the description of the invention in this template. If you choose to use an attachment, make sure you answer all the questions in the template.		Place: Oulu	Date: 21.3.2003
		Signature of receiver:	
Names, employee numbers, job titles and nationalities of all inventors: Seppo Rousu RF Chief Engineer Finland	Home addresses of the inventors in respective order: Seppo Rousu Sahankuja 1 90800 Oulu Finland	Business/Technology Units and cost centres: NMP Technology	
Marko Leinonen RF Senior Specialist Finland	Marko Leinonen Rantapellontie 1 C 9 90520 Oulu Finland	EMBU	
Email addresses of the inventors working outside Nokia:			
Office address of the first inventor acting as a contact: Elektonikkatie 10, 90571 Oulu			
Phone of the first inventor: +358 (0)50 5626068	Fax of the first inventor:		
Line manager(s): Tomi Moilanen			
Project: Grape engine platform	Project Manager: Mika J. Väyrynen		
Related product(s): Grape, Yoda, MX2	Related standard(s):		
The invention becomes public on (see section 11 of the invention report): 1Q/05			
I am/ We are the sole/ and original inventor(s) of this invention.			
The company may, by virtue of applicable legislation, be entitled to full or partial rights to the invention. I/ We acknowledge my/ our obligation to sign as inventor(s) all documents that may be required for protecting the invention in different countries.			
Applicable to inventions made by inventors employed in FI, DK, DE and SE only. Unless the inventor requests the Invention Report to be responded to within four (4) months from the date this Invention Report is received or such other period as the mandatory provisions of the applicable local law may otherwise require, the inventor consents to the right of the employer to use a reasonable period of time for the evaluation of the invention. A reasonable period of time may exceed four (4) months. <input checked="" type="checkbox"/> I/ We request that the Invention Report be responded to within four (4) months.			
Date: 21.3.2003	Signature(s) of Inventor(s): Seppo Rousu, Marko Leinonen		

FORMAL REQUIREMENTS FOR FILING THE INVENTION REPORT

The invention report must have the names of all the inventors and their home addresses. The first mentioned inventor is assumed to be the contact person in matters concerning the invention report. In the fields of office address, phone and fax, please fill in the contact person's information. Fill in the project field, if the invention is made in a project. The original Invention Report is signed by all inventors. Each page of the original invention report is signed by a manager. In case it is difficult to obtain the manager's signature your patent department will take care of it. The signed invention report is given directly to the local or business or unit's patent department. The invention report should also be submitted electronically to the patent department of the business or technology unit.

I have read and understood the invention described in this Invention Report

Date: 21.3.2003

Signature of Manager or Patent Engineer

J. Rousu

K. Leinonen

DESCRIPTION OF THE INVENTION

1. Field of technology and background

Describe here the technology and the areas of use the invention relates to. Provide here general background knowledge that is required to understand the framework of the invention, and describe the problem to be solved and the invention later.

GSM/CDMA/WCDMA and GPS (Global Positioning System) will be implemented in same phone. GPS receiver is not performing well if other systems are transmitting due to wideband noise generated to top of GPS band 1575.42 MHz +/- 5.

2. Problem

Describe here the problem that the invention solves or the situation that the invention improves, and preferably concentrate on the technical aspects of the problem or the situation.

Other communication systems are generating wideband noise to GPS band 1575.42 MHz +/- 5 MHz. This wideband noise prevents performance of GPS receiver.

From measurements can be said that without external GPS notch filter in TX path, GPS RX signal to noise ratio degrades about 2dB in single slot TX-mode and 3dB in dual slot TX-mode.

Other solution 1 blanking gps rx during gsm tx burst

One solution to improve GPS sensitivity during GSM TX burst is to blank/dismiss GPS receiver when GSM is transmitting. This means that GPS filter in cellular path is not needed. Blanking GPS RX in theory we lose 0.577ms of GPS information in 4.616 ms, which is equivalent to a GPS sensitivity loss of 0.6dB for 1 slot GSM. For dual slot GSM we lose 1.154 ms of GPS information in 4.616 ms, which is equivalent to a GPS sensitivity loss of 1.2 dB. These losses are probably acceptable.

This have been patented in prior art.

Other solution 2. External gps notch-filter

Oneother solution to improve GPS RX signal to noise ratio during DCS or PCS TX is to add external GPS notch-filter to TX path. Passband frequency of filter has to be 1710-1910 MHz and stop band frequency range 1558.42-1580.43 MHz. The problem is that we need to add very much attenuation for GPS band to improve GPS RX SNR to desired level (0.5dB SNR degradation). This increases also filter's insertion loss and because that extra loss after PA we have to take more output power from power amplifier which increases current consumption.

In tables 5, 6 and 7 GPS RX signal to noise ratio degradation versus GPS filtering are shown. Antenna isolation was 10dB.

Table 5: GPS RX SNR degradation vs. GPS filtering (TX 1/8)

	GSM850	GSM1800	GSM1900
GPS band rej. 0dB	0	1.5 ... 2.0	1.5
GPS band rej. 10dB	0	1 ... 1.5	1
GPS band rej. 20dB	0	1	0.5

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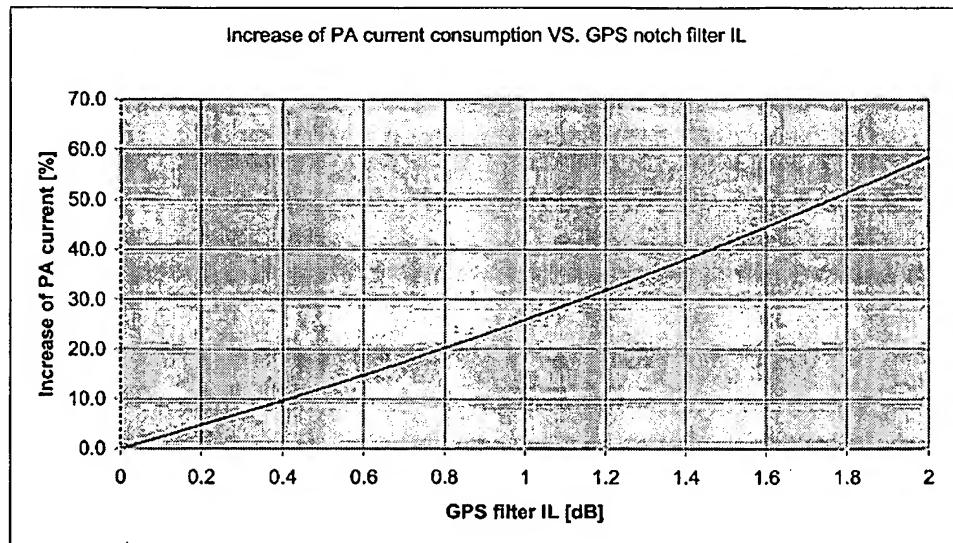
GPS band rej. 30dB	0	0.5	0
GPS band rej. 40dB	0	0	0

Table 6: GPS RX SNR degradation vs. GPS filtering (TX 2/8)

	GSM850	GSM1800	GSM1900
GPS band rej. 0dB	0	3	2.5 ... 3
GPS band rej. 10dB	0	2.5 ... 3	2.5
GPS band rej. 20dB	0	1.5 ... 2	1 ... 1.5
GPS band rej. 30dB	0	0.5 ... 1	0.5
GPS band rej. 40dB	0	0.5	0

From measurement it can be seen that if we want to improve GPS SNR to desired level (0.5dB degradation) we have to add 20dB external GPS band attenuator to GSM1900 TX path and 30dB attenuator for GSM1800 TX path. Insertion loss of GPS notch-filter with 30dB GPS band attenuation will be somewhere between 0.7dB – 1.0dB. This amount of *IL after PA increases PA current consumption about 20%*.

Figure1. Increase of PA current consumption versus GPS notch-filter insertion loss.



Benefits of Notch-filter

1. If we add enough attenuation to notch-filter, GSM TX does not affect anything to GPS RX sensitivity.

Disadvantages of Notch-filter

1. One extra component is needed.

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2. Power amplifier specification has to be updated.
3. Power amplifier current consumption increases about 20%.
4. GPS front-end filter specification has to be updated and tighten up if we want that GPS works well also when GSM1800 is transmitting.
5. Costs are high to improve GPS SNR only about 1.5dB.

3. Prior art

Describe here how the problem was solved earlier. Please state also the source of prior art accurately.

Currently we have two possible solutions which have been considered to be implanted.

- A) Place GPS notch filter in Transmitter chain to reduce TX noise on GPS band.
- B) Use patented solution by third party. GPS receiver is blanked when GSM transmitter is transmitting. In below is presented corresponding US patent application.

United States Patent 6,107,960
Krasner August 22, 2000

Reducing cross-interference in a combined GPS receiver and communication system

Abstract

A method and apparatus is disclosed for reducing cross-interference in a combined satellite positioning system receiver and communication transceiver device. A control signal is transmitted from the communication transceiver to the satellite positioning system receiver when the communication transceiver transmits data at a high power level over a communication link. The control signal causes satellite positioning system signals from satellites to be blocked from the receiving circuits of the satellite positioning system receiver, or to be disregarded by the processing circuits of the satellite positioning system receiver.

4. Invention

Put here a short crystallization of the invention on a general level including possible use cases.

Invention is to vary received GPS signal strength from the information of the other transmitter AGC signal level. Idea is to increase attenuation in GPS receiver when other transmitter is transmitting with high power level. When high power level transmitted then also wide band noise level is high.

Extra insertion loss before first amplifier will degrade receiver sensitivity, which is not desired. Thus the variable gain attenuator should be placed after LNA.

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The idea of the operation:

When mobile transmitter is transmitting with low power no extra attenuation is applied to GPS signal since the wide band noise level is low enough for GPS reception.

When mobile terminal is transmitting with high power level extra attenuation is applied to GPS signal in order to prevent GPS signal to base band reception. This GPS signal prevention is wanted feature since GPS receiver stands better lack of GPS signal than noise is applied into GPS receiver. In problem statement chapter some performance numbers are presented.

The attenuation can be made variable and thus GPS receiver is adaptable to current transmission noise level.

5. Implementation

Describe exemplary implementations in detail with alternatives here, including at least the implementation you consider to be the best. Describe the crucial elements in detail.

Implementation is done by applying the AGC (Automatic gain control) signal of the mobile transmitter into GPS receiver. When mobile transmitter is transmitting with high power level then high attenuation is applied to GPS receiver. When mobile transmitter is transmitting with low power level then low attenuation is applied to GPS signal.

6. Advantages and disadvantages

Describe here how the invention improves earlier solutions. Also, if you are aware of any advantages or disadvantages, please state them here.

Advantage:

- easy to implement. This extra attenuation can be done with external attenuator in GPS receiver chain or with integrated AGC functionality in GPS receiver. This AGC functionality is already build-in in GPS receiver.
- This proposed method perform equally or better than pure blanking or ignoring incoming GPS signal. This proposed method is adaptable to current operation condition. In some cases GPS signal is marginal attenuated and thus GPS reception can be maintained even with existence of transmission.

7. List of figures

Write the figure captions here as a list (Figure 1 presents ..., Figure 2 presents ...) and include the images into the invention report (section 5 or section 15) in Word-compatible format (i.e., no embedded images that won't show on the screen when the document is viewed) labelled with the figure number (Figure 1., Figure 2.). Alternatively, include the figures in a separate document (PowerPoint etc.), but make sure to include the description of the figures also here.

Figure 1. Principle block diagram of the invention

Figure 2. Possible way to implement invention

Figure 3. Possible way to implement invention

Figure 4. Possible way to implement invention

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8. List of abbreviations

PCS = Personal communication system, widely used for 1900 band

DCS = digital communication system, widely used for 1800 band

9. Supervision

Explain here how we can (if possible) recognise if a competitor is using the same product/feature.

The operation can be easily seen if the attenuation of the GPS signal is varied according the transmission power level.

10. Commercial value

Evaluate three aspects here: a) is the invention planned to be used in a Nokia product (which), b) is the invention going to be proposed to a standard (which), and c) would Nokia's competitors benefit from the use of the invention (who/how)?

a) Invention is potential solution to be used in all GSM/GPS and for WCDMA-GSM/GPS products and CDMA/GPS products and with all other possible combinations of radio transmitting systems.
This is easiest way to overcome to prior art patent.

c) Competitors can use also invention when cross licence.

11. Publication

If the invention is becoming public in any way, please describe the exact way and details of publication here: what will be disclosed and how. For example, submission of standardization contributions, scientific papers, conference abstracts, theses or papers written for a degree and commercial brochures and offers for sale may be considered as "publication". Also, any use in a product that is publicly available or disclosure (written or oral) to another company without a non-disclosure agreement (NDA) is considered to be a publication.

Invention is applicable with Gryphons GPS by Nokia, which will be available 1Q/05.
Yoda is may be lead product to use GryphonS.

12. Dates of the invention

If you can, put here the date when you first thought of the invention (this date should be verifiable from your personal dated notes). Also, if you have completed the invention, e.g., written a computer program, put this date here (the completion should be verifiable by a witness). Also, provide all evidence material relating to the dates to the patent department.

21.3.2003

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13. Experts

If you know any experts that are able to comment the invention, list them here. Also, please mention if you are aware that a certain patent engineer has earlier experience of similar invention reports.

Juha Maalismaa patent engineer
Jaakko Hulkko expert

14. Further comments

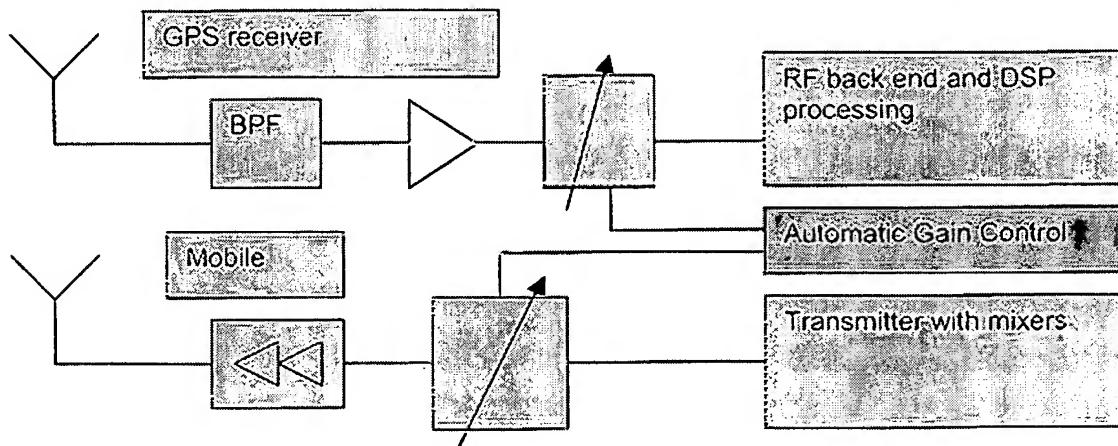
Any further comments may be put here, e.g., if you consider the invention to require further development, know of a related earlier invention report in Nokia by you or others, or have any additional information that you think may otherwise affect the decision process.

Need to handle as soon as possible. If will be patented, so all countries covered.

15. The figures

Place the figures here, or among the description of the implementation. Alternatively, include the figures in a separate document (PowerPoint etc.).

Figure 1 Principal block diagram of the invention.



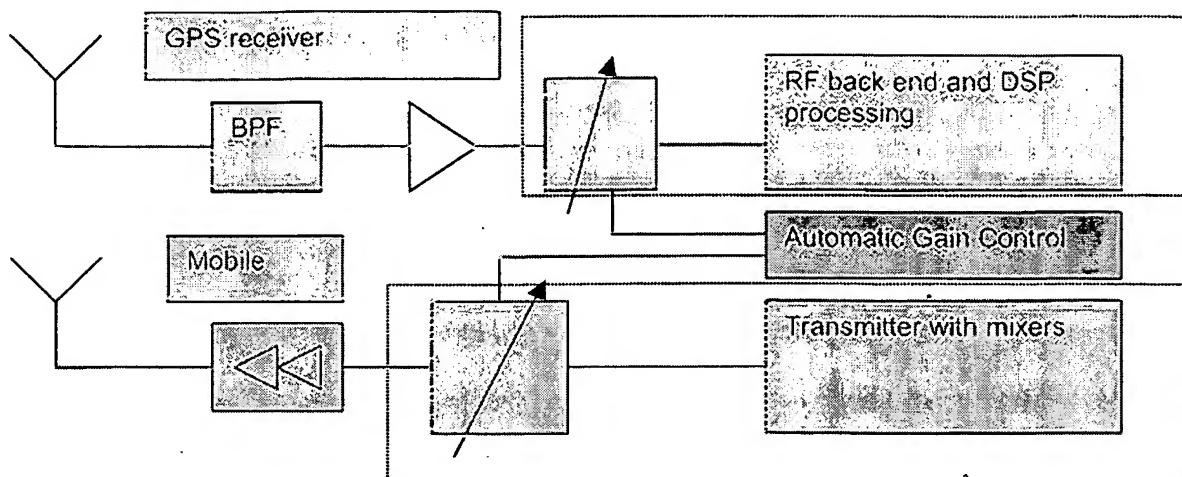
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Figure 2 Possible way to implement invention.

Dotted line presents that functionalites can be integrated into one ASIC

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Figure 3. Possible way to implement invention.

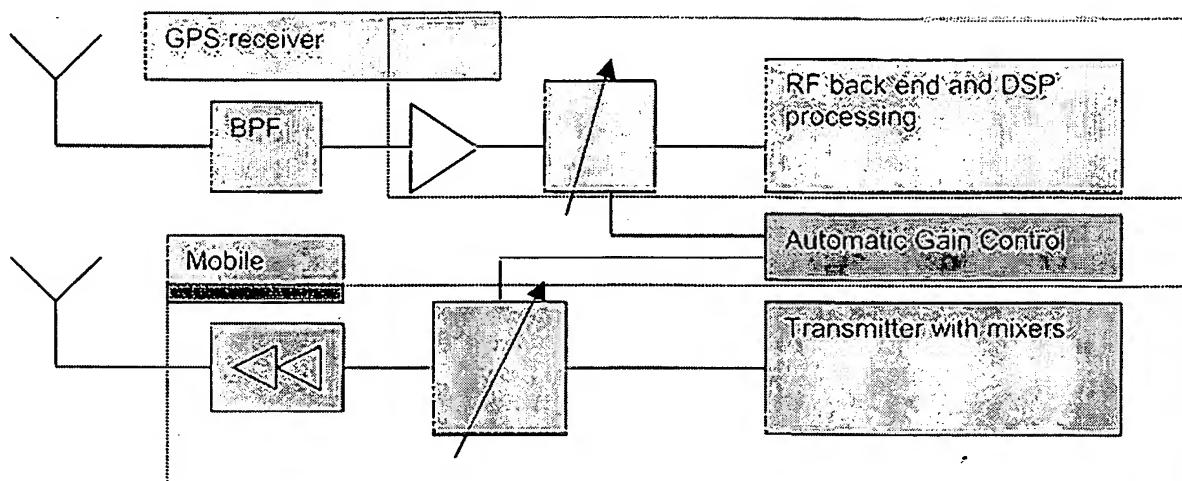
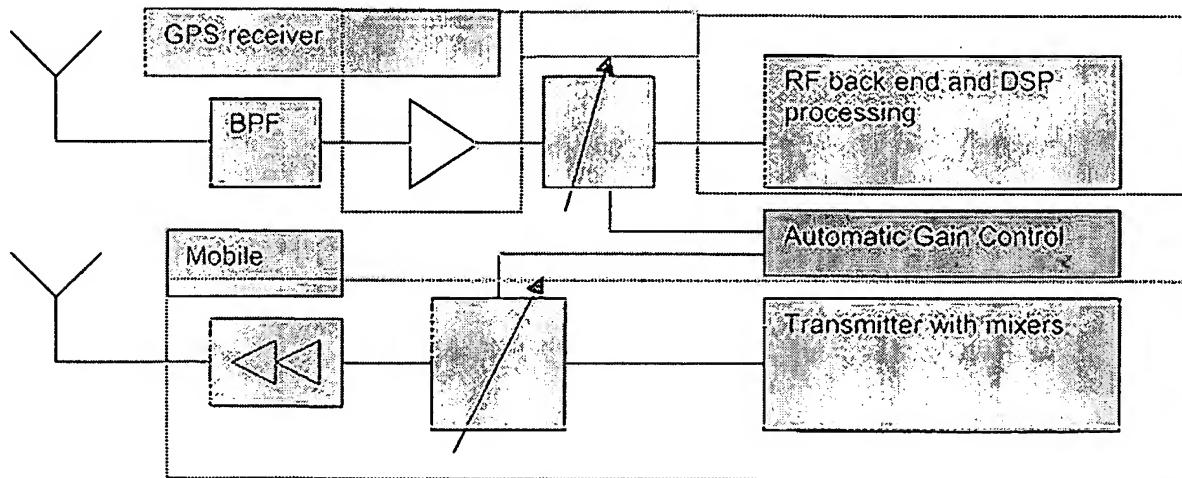


Figure 4. Possible way to implement invention.



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